

University of Groningen

## Coordination networks under noisy measurements and sensor biases

Shi, Mingming

DOI:  
[10.33612/diss.99968844](https://doi.org/10.33612/diss.99968844)

**IMPORTANT NOTE:** You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

*Document Version*  
Publisher's PDF, also known as Version of record

*Publication date:*  
2019

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*

Shi, M. (2019). *Coordination networks under noisy measurements and sensor biases*. [Thesis fully internal (DIV), University of Groningen]. Rijksuniversiteit Groningen. <https://doi.org/10.33612/diss.99968844>

### Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

### Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

# PROPOSITIONS

belonging to the thesis

## COORDINATION NETWORKS UNDER NOISY MEASUREMENTS AND SENSOR BIASES

by

MINGMING SHI

---

1. For network consensus, bounded communication noise has the ability of disrupting the convergence to node agreement. It may also drive the state of nodes anywhere in sufficiently long time, which may be irrational in reality.
2. The adaptive threshold method can achieve practical consensus and ensure the bounded evolution of the consensus process, even when the communication suffers from unknown but bounded noise.

– Chapter 3

3. Saturating the received states of the neighbors can decouple the consensus error from the initial condition of the system and disentangle the bound on the node state from the noise.

– Chapter 4

4. As long as the nodes are able to get access to their own absolute states, it is possible to achieve practical consensus and ensure bounded system evolution.

– Chapters 3 and 4

5. When the measurement graph induced by the sensor network is not bipartite, even if all the sensors are biased, it is not difficult to estimate the biases and identify the biased sensors.

– Chapters 5

6. When the measurement graph is bipartite, to obtain an unbiased estimation of the biases, more than half of the sensors should be unbiased. When the biases are heterogeneous, they can be estimated even if the majority of the sensors are biased.

– Chapter 5

7. Doing research is a process of exploration, requiring the researchers to break the restrictions in their mind and set aside biases.